

CLAIMS

1. A heat transfer fin, comprising:

5 a heat transfer plate for transferring heat of a heat transfer medium via the heat transfer plate, the heat transfer plate being disposed parallel or nearly parallel to a flowing direction of the heat transfer medium,

10 wherein a heat transfer medium inlet side edge of the heat transfer plate is formed so as to become thinner toward an upstream side of a heat transfer medium flowing direction.

2. The heat transfer fin as recited in claim 1, wherein a heat transfer medium outlet side edge of the heat transfer plate is formed so as to become thinner toward a downstream side of the heat transfer medium flowing direction.

3. A heat transfer fin, comprising:

20 a plurality of heat transfer plates disposed in parallel with each other at certain intervals to form an air passage between adjacent heat transfer plates, whereby heat of air passing through the air passage is transferred via the heat transfer plates,

wherein a windward side edge of the heat transfer plate is formed so as to become thinner toward a windward side of the air.

25 4. The heat transfer fin as recited in claim 3, wherein the plurality of heat transfer fins are disposed independently as plate fins.

5. The heat transfer fin as recited in claim 3, wherein the plurality of heat transfer fins are connected such that adjacent heat transfer fins are connected to form a corrugated fin.

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6. A heat transfer fin, comprising:

a plurality of heat transfer plates disposed between a pair of heat exchanging tubes arranged in parallel at a certain distance, the plurality of heat exchanging plates being disposed in parallel with each other at certain intervals along a longitudinal direction of the heat exchanging tube to form an air passage between adjacent heat exchanging tubes, whereby air passing through the air passage exchanges heat with refrigerant passing through the heat exchanging tubes,

15 wherein a windward side edge of the heat transfer plate is formed so as to become thinner toward a windward side of the air.

7. The heat transfer fin as recited in claim 6, wherein the plurality of heat transfer plates are disposed independently as plate fins.

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8. The heat transfer fin as recited in claim 6, wherein the plurality of heat transfer plates are connected such that adjacent heat transfer fins are connected to form a corrugated fin.

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9. The heat transfer fin as recited in claim 6, wherein the plurality of heat transfer plates are integral skived fins formed

by skiving a surface of the heat exchanging tube.

10. The heat transfer fin as recited in any one of claims 3 to 9, wherein a cross-sectional contour configuration of the windward side edge of the heat transfer plate is formed into a curved configuration.

11. The heat transfer fin as recited in claim 10, wherein a cross-sectional contour configuration of the windward side edge of the heat transfer plate is formed into a semielliptic configuration.

12. The heat transfer fin as recited in claim 10, wherein a cross-sectional contour configuration of the windward side edge of the heat transfer plate is formed into a semicircular configuration.

13. The heat transfer fin as recited in any one of claims 3 to 9, wherein a cross-sectional contour configuration of the windward side edge of the heat transfer plate is formed into a polygonal configuration.

14. The heat transfer fin as recited in claim 13, wherein the cross-sectional contour configuration of the windward side edge of the heat transfer plate is formed into a triangular configuration with an acute-angled tip.

15. The heat transfer fin as recited in any one of claims 3 to 14, wherein a leeward side edge of the heat transfer plate is formed so as to become thinner toward a leeward side of the air.

5 16. A heat transfer fin, comprising:

a heat transfer plate disposed parallel or nearly parallel to a heat transfer medium passing direction, the heat transfer plate being provided with a plurality of louvers at certain intervals along the heat transfer medium passing direction to transfer heat of the
10 heat transfer medium via the heat transfer plate,

wherein a heat transfer medium inlet side edge of the louver is formed so as to become thinner toward an upstream side of the heat transfer medium passing direction.

15 17. The heat transfer fin as recited in claim 16, wherein a heat transfer medium outlet side edge of the heat transfer plate is formed so as to become thinner toward a downstream side of the heat transfer medium passing direction.

20 18. A heat transfer fin, comprising:

a plurality of heat transfer plates disposed in parallel with each other at certain intervals to form an air passage between adjacent heat transfer plates, the heat transfer plate being provided with a plurality of louvers at certain intervals along the
25 air passage to transfer heat of air passing through the air passage via the heat transfer plate,

wherein a windward side edge of the louver is formed so as

to become thinner toward an upstream side of the air.

19. The heat transfer fin as recited in claim 18, wherein the plurality of heat transfer fins are connected such that adjacent
5 heat transfer fins are connected to form a corrugated fin.

20. A heat transfer fin, comprising:

a plurality of heat transfer plates disposed between a pair of heat exchanging tubes arranged in parallel at a certain distance,
10 the plurality of heat transfer plates being disposed in parallel with each other at certain intervals along a longitudinal direction of the heat exchanging tube to form an air passage between adjacent heat transfer plates, and the heat transfer plate being provided with a plurality of louvers at certain intervals along the air passage,
15 whereby air passing through the air passage exchanges heat with refrigerant passing through the heat exchanging tubes,

wherein a windward side edge of the louver is formed so as to become thinner toward a windward side of the air.

20 21. The heat transfer fin as recited in claim 20, wherein the plurality of heat transfer fins are connected such that adjacent heat transfer fins are connected to form a corrugated fin.

25 22. The heat transfer fin as recited in any one of claims 18 to 21, wherein a cross-sectional contour configuration of the windward side edge of the louver is formed into a curved configuration.

23. The heat transfer fin as recited in claim 22, wherein a cross-sectional contour configuration of the windward side edge of the louver is formed into a semielliptic configuration.

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24. The heat transfer fin as recited in claim 22, wherein a cross-sectional contour configuration of the windward side edge of the louver is formed into a semicircular configuration.

10 25. The heat transfer fin as recited in any one of claims 18 to 21, wherein a cross-sectional contour configuration of the windward side edge of the louver is formed into a polygonal configuration.

15 26. The heat transfer fin as recited in claim 25, wherein the cross-sectional contour configuration of the windward side edge of the louver is formed into a triangular configuration with an acute-angled tip.

20 27. The heat transfer fin as recited in any one of claims 18 to 26, wherein a leeward side edge of the louver is formed so as to become thinner toward a leeward side of the air.

28. A heat transfer fin, comprising:

25 a heat transfer plate disposed parallel or nearly parallel to a heat transfer medium passing direction, the heat transfer plate being provided with a plurality of louvers at certain intervals along

the heat transfer medium passing direction to transfer heat of the heat transfer medium via the heat transfer plate,

wherein a heat transfer medium inlet side edge of the heat transfer plate and that of the louver are respectively formed so as to become thinner toward an upstream side of the heat transfer medium passing direction.

29. The heat transfer fin as recited in claim 28, wherein at least one of heat transfer medium outlet side edges of the heat transfer plate and the louver is formed so as to become thinner toward a downstream side of the heat transfer medium passing direction.

30. A heat transfer fin, comprising:

a plurality of heat transfer plates disposed in parallel with each other at certain intervals to form an air passage between adjacent heat transfer plates, the heat transfer plate being provided with a plurality of louvers at certain intervals along the air passage to transfer heat of air passing through the air passage via the heat transfer plate,

wherein a windward side edge of the heat transfer plate and that of the louver are respectively formed so as to become thinner toward an upstream side of the air.

31. The heat transfer fin as recited in claim 30, wherein at least one of leeward side edges of the heat transfer plate and the louver is formed so as to become thinner toward a leeward side of the air.

32. A heat transfer fin, comprising:

a plurality of heat transfer plates disposed between a pair of heat exchanging tubes arranged in parallel at a certain distance, the plurality of heat exchanging plates being disposed in parallel with each other at certain intervals along a longitudinal direction of the heat exchanging tube to thereby form an air passage between adjacent heat transfer plates, the heat transfer plate being provided with a plurality of louvers at certain intervals along the air passage, whereby air passing through the air passage exchanges heat with refrigerant passing through the heat exchanging tubes,

wherein a windward side edge of the heat transfer plate and that of the louver are respectively formed so as to become thinner toward a windward side of the air.

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33. The heat transfer fin as recited in claim 32, wherein at least one of leeward side edges of the heat transfer plate and the louver is formed so as to become thinner toward a leeward side of the air.

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34. A heat transfer fin disposed in a heat exchanging tube through which refrigerant passes, the heat transfer fin comprising a heat transfer plate arranged parallel to a refrigerant passing direction to transfer heat of the refrigerant via the heat transfer plates,

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wherein a refrigerant inlet side edge of the heat transfer plate is formed so as to become thinner toward an upstream side of

the refrigerant passing direction.

35. The heat transfer fin as recited in claim 34, wherein a refrigerant outlet side edge of the heat transfer plate is formed so as to become thinner toward a downstream side of the refrigerant passing direction.

36. A heat transfer fin disposed in a heat exchanging tube through which refrigerant passes, the heat transfer fin comprising a plurality of heat transfer plates arranged parallel to a refrigerant passing direction, the heat transfer plates being provided with openings in a zigzag form to transfer heat of the refrigerant via the heat transfer plates,

wherein a side edge of the opening of the heat transfer plate facing an upstream side of the refrigerant passing direction is formed so as to become thinner toward the upstream side of the refrigerant passing direction.

37. The heat transfer fin as recited in claim 36, wherein a side edge of the opening of the heat transfer plate facing a downstream side of the refrigerant passing direction is formed so as to become thinner toward the downstream side of the refrigerant passing direction.

38. A heat transfer fin disposed in a heat exchanging tube through which refrigerant passes, the heat transfer fin comprising a plurality of heat transfer plates arranged parallel to a

refrigerant passing direction, the heat transfer plates being provided with openings in a zigzag form to transfer heat of the refrigerant via the heat transfer plates,

5 wherein a refrigerant inlet side edge of the heat transfer plate is formed so as to become thinner toward an upstream side of the refrigerant passing direction, and

10 wherein a side edge of the opening of the heat transfer plate facing the upstream side of the refrigerant passing direction is formed so as to become thinner toward the upstream side of the refrigerant passing direction.

39. The heat transfer fin as recited in claim 38, wherein a refrigerant outlet side edge of the heat transfer plate is formed so as to become thinner toward a downstream side of the refrigerant passing direction.

40. The heat transfer fin as recited in claim 38 or 39, wherein a side edge of the opening of the heat transfer plate facing a downstream side of the refrigerant passing direction is formed so as to become thinner toward the downstream side of the refrigerant passing direction.

41. A heat exchanger equipped with a heat transfer fin as recited in any one of claims 1 to 40.

42. An evaporator for use in car air-conditioners, the evaporator being equipped with a heat transfer fin as recited in

any one of claims 1 to 40.

43. A condenser for use in car air-conditioners, the
condenser being equipped with a heat transfer fin as recited in any
5 one of claims 1 to 40.